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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/749,946	12/29/2000	Abel C. Dasylva	57983.000018	6810

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Thomas E. Anderson  
Hunton & Williams  
1900 K Street, N.W.  
Washington, DC 20006-1109

EXAMINER

BELLO, AGUSTIN

ART UNIT	PAPER NUMBER
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2633

DATE MAILED: 06/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/749,946

Applicant(s)

DASYLVA ET AL.

Examiner

Agustin Bello

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 9-13 is/are rejected.
- 7) ☐ Claim(s) 6-8 and 14-16 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Response to Arguments***

1. In view of the appeal brief filed on 3/14/05, PROSECUTION IS HEREBY REOPENED. New grounds of rejection are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

- (1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,
- (2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 3-5, 9, and 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rasala (U.S. Patent No. 6,487,332) in view of Gu in the article "Efficient Protocols for Permutation Routing on All-Optical Multistage Interconnection Networks."

Regarding claims 1 and 9, Rasala teaches a method for interchanging wavelengths in a multiwavelength system having W wavelength channels, the method comprising the steps of:

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selectively directing a pair of adjacent frequency channels corresponding to a respective pair of adjacent wavelength channels based upon a routing algorithm (e.g. switches 13 in Figure 3 selectively direct adjacent channels based upon a non-blocking algorithm column 2 lines 6-11); interchanging the frequencies of the selectively directed pair of adjacent frequency channels (reference numeral 11 in Figure 3); and selectively shifting the interchanged frequencies of the selectively directed pair of adjacent frequency channels (reference numeral 21 in Figure 3 which routes the interchanged wavelengths). Rasala differs from the claimed invention in that Rasala fails to specifically teach that shifting of interchanged frequencies is based upon a binary representation of each interchanged frequency. However, shifting, which the applicant defines as routing throughout the specification and the claims, of interchanged frequencies based upon binary representations is well known in the art. Gu, in the same field of optical cross-connect structures, teaches that shifting frequencies based upon binary representations is well known in the art. Furthermore, Gu specifically describes a scenario wherein a given input pair is routed or shifted based upon a binary label corresponding to each input signal (page 515). One skilled in the art would clearly have recognized that since wavelengths in optical systems are labeled according to their frequency (e.g.  $\lambda_1, \lambda_2, \lambda_3 \dots$  etc.) and the disclosure of Gu teaches a method for routing or shifting based upon binary representations of input signal labels, the method of Gu could have been applied to wavelength routing or shifting system such as that taught by Rasala by translating the frequency labels of each input wavelength to their corresponding binary representations (e.g.  $\lambda_1, \lambda_2, \lambda_3 \rightarrow \lambda_{0001}, \lambda_{0010}, \lambda_{0011}, \text{etc.}$ ). One skilled in the art would have been motivated to shift or route signals according the disclosure of Gu in order to increase the number of permutations available in the system, thereby reducing the possibility of blocked signals, a

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benefit sought by Rasala in creating a strictly non-blocking cross-connect. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to shift the interchanged frequencies based upon a binary representation of each interchanged frequency.

Regarding claims 3, 5, 11, and 13, Rasala differs from the claimed invention in that Rasala fails to specifically teach routing the selectively directed pair of adjacent frequency channels based upon a binary representation of the frequency of each of the selectively directed pair of adjacent frequency channels. However, as noted in the rejection of claim 1, routing based upon a binary representation is well known in the art. One skilled in the art would have been motivated to shift or route signals according the disclosure of Gu in order to increase the number of permutations available in the system, thereby reducing the possibility of blocked signals, a benefit sought by Rasala in creating a strictly non-blocking cross-connect. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to rout the selectively directed pair of adjacent frequency channels based upon a binary representation of the frequency of each of the selectively directed pair of adjacent frequency channels.

Regarding claims 4 and 12, the combination of Rasala and Lee differs from the claimed invention in that it fails to specifically teach shifting the frequency of a first of the selectively directed pair of adjacent frequency channels by an amount defined by  $+\Delta f$ ; and shifting the frequency of a second of the selectively directed pair of adjacent frequency channels by an amount defined by  $-\Delta f$ ; wherein  $\Delta f$  is the frequency spacing between the pair of adjacent frequency channels. However, being that Rasala teaches wavelength interchanges in general, one skilled in the art would clearly have recognized that it would have been possible to shift the frequency of the channels by any amount desired including by  $\pm\Delta f$ . Furthermore, interchanging

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of frequency channels by shifting them by the frequency spacing is well known in the art.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to shift the frequency of a first of the selectively directed pair of adjacent frequency channels by an amount defined by  $+\Delta f$ , and shifting the frequency of a second of the selectively directed pair of adjacent frequency channels by an amount defined by  $-\Delta f$ , wherein  $\Delta f$  is the frequency spacing between the pair of adjacent frequency channels.

4. Claims 2 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rasala in view of Gu and Dragone (U.S. Patent Application Publication No. 2003/0091271).

Regarding claim 2, the combination of Rasala and Gu differs from the claimed invention in that Rasala fails to specifically teach selectively switching the pair of adjacent frequency channels to one of two output pairs. However, Rasala suggests as much in that switches 13 in Figure 3 of Rasala selectively switch at least a pair of adjacent frequency channels to one of at least two output pairs. Regardless, selectively switching the pair of adjacent frequency channels to one of two output pairs is well known in the art. Dragone in the same field of optical switching teaches such a method (Figure 5B). One skilled in the art would have been motivated to employ the method of Dragone in the device of the combination of Rasala and Gu in order to limit the number of signals traversing each element of the switching element to one, thereby guaranteeing non-blocking functionality (paragraph [0038] of Dragone). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to selectively switching the pair of adjacent frequency channels to one of two output pairs.

Regarding claim 10, the combination of Rasala, Gu, and specifically Dragone teaches that the switching element comprises: a cross-connect (e.g. the left-most pair of 2x2 switches in

Figure 5B of Dragone) for selectively switching the pair of adjacent frequency channels to one of two output pairs.

***Allowable Subject Matter***

5. Claims 6-8 and 14-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Wu et al. disclose relevant art.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Agustin Bello whose telephone number is (571) 272-3026. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571)272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AB

  
JASON CHAN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600

  
AGUSTIN BELLO  
PATENT EXAMINER